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L-2321

Texas Agricultural Extension Service
The Texas A&M University System

Texas Citrus

Young Grapefruit Orchard Production Costs and Returns – Years 4 to 7

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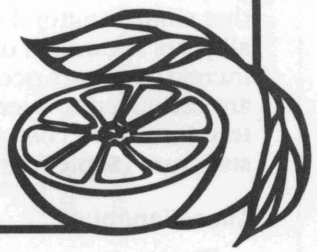

Grapefruit groves planted after the 1989 freeze are in a state of increasing production with accompanying increases in production costs. These trees have not reached maturity or maximum production potential.

The Texas Agricultural Extension Service fact sheet *Grapefruit Orchard Establishment Costs - Years 1 to 3* (L-2327) evaluated land preparation costs and associated costs of developing the orchard through the third year, which usually provides the first fruit from the immature trees. A summary of the first 3 years' budgets (from the above publication) is shown in Table 1.

This paper discusses the expected costs and returns for the specific case of a small-acreage, high-technology operation, during the intermediate years (years 4 to 7) between grove establishment and full production. Since new tree groves planted after the 1989 freeze are currently in their fourth year after planting, estimates of the expected costs and yields for the fourth through seventh years must be highly dependent on historical yields from groves planted after the 1983 freeze, current cultural operations, and expectations of scientists and grove care managers and grove owners.

Assumptions

Data used to support this publication were collected from orchard managers, grove care companies, research scientists, agribusinesses, Texas A&M-Kingsville Citrus Center at Weslaco personnel, and Texas A&M University Extension and Research specialists.

Land Tenure

The three most common types of citrus operations in the Lower Rio Grande area are:

1) grove care management services for investor-owned orchards;
2) owner-managed with major equipment operations performed by use of custom services; and
3) complete owner/operator-managed orchards.

This paper concentrates on the first category where equipment and services are provided by the grove care company with major spray operations and services charged at a custom rate. This approach will more closely reflect the costs associated with absentee ownership contracting professional management of the grove. It is understood that costs of owner management would vary considerably based on size of grove and skill of management.

Returns

Returns are to ownership and risk.

Orchard Characteristics

A hypothetical 20-acre orchard model is used throughout this study, but the costs are discussed on a cost-per-acre basis. It was necessary to select an historically economic unit because high management and equipment requirements and operation size substantially influence establishment costs. It is understood that a larger tract of land would probably reduce the cost-per-acre charges for equipment and cultural operations in both an owner/manager situation and a grove care situation. A tree density of 145 trees per acre is used.

Soil and Irrigation

It is assumed that the orchard is established on alluvial soil and needs no drainage system. Rio Grande River water supplied through existing water districts is used as a primary source of water, applied through a permanent valve system.

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Costs and Prices

Costs are based on fall 1993 and spring 1994 data. Costs associated with maintaining a mature grove are utilized in years 5 through 7 assuming that similar cultural operations were required for all years regardless of the trees' age with little increase in costs occurring. Grapefruit sale prices are estimated to average $125 per ton. Grapefruit tree insurance costs are based on the zone 2 rate structure (September 1994 schedule).

Miscellaneous

The study assumes that all equipment, labor and other supplies will be obtained specifically for the establishment and operation of the orchard by the grove care company and will be charged out at acceptable custom rates. Harvesting will be conducted and paid for by the buyer.

Tax Issues

This study does not address income tax issues. Tax implications should be addressed in the context of the total business and with specialized professional assistance.

Investment Warning

The values provided in these budgets represent an average of the costs and returns obtained from growers and grove care managers with projections utilized for the latter years. They do not represent the costs and returns of any particular orchard. Potential investors should modify these estimates and adapt them to more accurately describe a specific operation.

Orchard Development and Operational Costs and Returns

Table 2 provides an estimate of the costs and returns to develop a citrus orchard during the intermediate years between the planting and establishment years and mature production. The values provided in these budgets represent an average of the costs and returns that were obtained from growers. They do not represent the costs and returns of any particular orchard.

Returns to Risk and Ownership

A small amount of production should begin in the third year. During the second year of economic production (year 4), variable production costs will average about $761 per acre with overhead costs averaging about $451 per acre for a total projected cost of about $1,212 per acre and a $202 per ton break-even price requirement to cover all costs. An expected yield of 6 tons per acre sold at $125 per ton would yield a gross income of $750 and a net return of ($462) per acre.

Nine tons per acre are expected in the fifth year grossing $1,125 per acre. Subtracting the total costs of $1,381 from the total income provided expected net revenue of ($256).

In the sixth year, the yield is expected to be 14 tons per acre with an expected gross income of $1,750 per acre. The total cost of $1,381 per acre subtracted from the income leaves $369 net return per acre. This is the first year with a positive net return per acre since planting.

In the seventh year after planting, the fruit harvest is expected to climb to 18 tons per acre. This production sold at $125 per ton yields a gross income of $2,250 per acre. A total production cost of $1,381 per acre leaves a net return of $869 per acre with a $76.72 break-even price required to cover the year's total expenses.

Income above variable costs is expected to occur in the fifth year after planting, and the income will surpass total costs in the sixth year after planting.

Table 1. Grapefruit Orchard Establishment (Years 1 to 3) Lower Rio Grande Valley of Texas; 1994 Projected Costs and Returns Under Commercial Grove Care Management (145 Trees Per Acre).

	Establishment (Year 1)				Establishment (Year 2)				Establishment (Year 3)			
Gross Income Description	**Quantity**	**Unit**	**$/Unit**	**Total**	**Projected Yield**	**Unit**	**$/Unit**	**Value**	**Projected Yield**	**Unit**	**$/Unit**	**Value**
Grapefruit	**0.000**	**tons**	**$125.00**	**$0.00**	**0.200**	**tons**	**$125.00**	**$25.00**	**3.0**	**tons**	**$125.00**	**$375.00**
- WARNING - No gross receipts	**0.000**	**tons**	**$125.00**	**$0.00**				**$25.00**				**$375.00**
Variable Cost Description	**Quantity**	**Unit**	**$ / Unit**	**Total**	**Quantity**	**Unit**	**$/Unit**	**Total**	**Quantity**	**Unit**	**$/Unit**	**Total**
Year 1												
Land Prep and Level	1.00	acre	150.00	150.00								
Trees	145.00	tree	4.00	580.00								
Layout, Plant	145.00	tree	1.25	181.25								
Tree Wrap	145.00	tree	1.00	145.00								
Fung-Insec + (Treat & Wrap Labor)	145.00	tree	1.00	145.00								
Tree Insurance	1.00	acre	37.95	37.95	1.00	acre	69.00	69.00	1.0	acre	$92.00	$92.00
Nitrogen (Actual N)	17.00	lb.	0.37	6.29	35.00	lb.	0.37	12.95	74.0	lb.	0.37	27.38
Fertilizer Application	4.00	appl	4.00	16.00	4.00	appl	4.00	16.00	3.0	appl	4.00	12.00
Preemerge Herbicide	2.00	appl	38.00	76.00	2.00	appl	38.00	76.00	2.0	appl	38.00	76.00
Preemerge Herbicide Application	2.00	appl	20.00	40.00	2.00	appl	20.00	40.00	2.0	appl	20.00	40.00
Spot Herbicide	2.00	appl	9.00	18.00	2.00	appl	9.00	18.00	2.0	appl	9.00	18.00
Spot Spray Application	2.00	appl	15.00	30.00	2.00	appl	15.00	30.00	2.0	appl	15.00	30.00
Pesticides	2.00	appl	27.00	54.00	3.00	appl	37.00	111.00	3.0	appl	42.00	126.00
Pesticide Application	2.00	appl	35.00	70.00	3.00	appl	35.00	105.00	3.0	appl	35.00	105.00
Irrigation Water	7.00	irri	8.00	56.00	7.00	irri	8.00	56.00	7.0	appl	8.00	56.00
Irrigation Labor	5.00	hour	9.50	47.50	6.00	hour	9.50	57.00	7.0	hours	9.50	66.50
Tree Replacement					1.00	tree	8.00	8.00				
Wrap and Unwrap Trees					1.00	acre	70.00	70.00				
Total Preharvest Year 1				$1,652.99		Year 2		$668.95		Year 3		$648.88
Interest - OC Borrowed	$1,291.78	Dol.	0.12	$155.01	$453.41	Dol.	0.12	$54.41	$399.78	Dol.	0.12	$47.97
Total Variable Cost				$1,808.00				$723.36				$696.86
Gross Income minus Variable Cost				($1,808.00)				($723.36)				($321.86)

Fixed Cost Description	**Unit**		**Total**		**Unit**		**Total**		**Unit**		**Total**
Misc Admin & Overhead	1.00	Acre	35.00	35.00	1.00	Acre	$35.00	$35.00	1.00	Acre	$35.00	$35.00
Interest Rate for Amortized Investments	9.00%				9.00%				9.00%			
Irrigation System (Permanent Valve)	$350.00	Acre	15 yr Recov	43.42	$350.00	Acre	15 yr Recov	43.42	$350.00	Acre	15 yr Recov	43.42
Land	1,500.00	Acre	15 Yr Recov	186.09	1,500.00	Acre	15 Yr Recov	186.09	1,500.00	Acre	15 Yr Recov	186.09
Perennial Crop (1st Year Establishment Costs)	$2,072.51	Acre	Annual Interest	186.53	$2,072.51	Acre	Annual Interest	186.53	$2,072.51	Acre	Annual Interest	186.53
Total Fixed Cost				$264.51				$451.04				$451.04
Total of All Cost				$2,072.51				$1,174.39				$1,147.89
Net Projected Returns to Risk and Ownership Per Acre				($2,072.51)				($1,149.39)				($772.89)
Breakeven Price – Total Costs/Acre					$5,371.97 per ton of Grapefruit				$382.63 per ton of Grapefruit			

Table 2. Grapefruit Orchard Development (Years 4 to 7) Lower Rio Grande Valley of Texas; 1994 Projected Costs and Returns Under Commercial Grove Care Mangement (145 Trees Per Acre).

	Year 4				Year 5		Year 6		Year 7	
Gross Income Description	**Quantity**	**Unit**	**$ / Unit**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**
Grapefruit	**6.0**	**Tons**	**$125.00**	**$750.00**	**9.00**	**$1,125.00**	**14.00**	**$1,750.00**	**18.00**	**$2,250.00**
Total Gross Income				**$750.00**		**$1,125.00**		**$1,750.00**		**$2,250.00**
Variable Cost Description	**Quantity**	**Unit**	**$ / Unit**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**	**Quantity**	**Total**
YEAR 4										
Preharvest										
Tree Insurance	1.0	acre	$103.50	$103.50	1.00	$115.00	1.00	$115.00	1.00	$115.00
Nitrogen (Actual N)	80.0	lb.	0.37	29.60	150.00	55.50	150.00	55.50	150.00	55.50
Fertilizer Appl	3.0	appl	4.00	12.00	3.00	12.00	3.00	12.00	3.00	12.00
Preemerge Herbicide	2.0	appl	38.00	76.00	2.00	76.00	2.00	76.00	2.00	76.00
Preemerge Herbicide Application	2.0	appl	20.00	40.00	2.00	40.00	2.00	40.00	2.00	40.00
Spot Herbicide	2.0	appl	9.00	18.00	2.00	18.00	2.00	18.00	2.00	18.00
Spot Spray Application	2.0	appl	15.00	30.00	2.00	30.00	2.00	30.00	2.00	30.00
Pesticides	3.0	appl	56.00	168.00	4.00	256.00	4.00	256.00	4.00	256.00
Pesticide Application	3.0	appl	35.00	105.00	4.00	140.00	4.00	140.00	4.00	140.00
Irrigation Water	7.0	appl	8.00	56.00	7.00	56.00	7.00	56.00	7.00	56.00
Irrigation Labor	7.0	hours	9.50	66.50	7.00	66.50	7.00	66.50	7.00	66.50
Total Preharvest Year 4				$704.60		$865.00		$865.00		$865.00
Interest - OC Borrowed	$466.30	dol.	0.12	55.96	543.22	$65.19	543.22	$65.19	543.22	$65.19
Total Variable Cost				$760.56		$930.19		$930.19		$930.19
Breakeven Price - Total Variable Cost/Ton				$126.76		$103.35		$66.44		$51.68
Gross Income minus Variable Costs				($10.56)		$194.81		$819.81		$1,319.81
Fixed Cost Description		**Unit**		**Total**		**Total**		**Total**		**Total**
Misc Admin & Overhead	1.00	Acre	$35.00	$35.00	1	$35.00	1	$35.00	1	$35.00
Interest Rates For Amortized Investments	9.00%				9.00%		9.00%		9.00%	
Irrigation System (Permanent Valve)	$350.00	Acre	15 Yr Recov	43.42	$350.00	43.42	$350.00	43.42	$350.00	43.42
Land	$1,500.00	Acre	15 Yr Recov	186.09	$1,500.00	186.09	$1,500.00	186.09	$1,500.00	186.09
Perennial Crop (1st Year Establishment Costs)	$2,072.51	Acre	Annual Interest	186.53	$2,072.51	186.53		2,072.51		186.53
Total Fixed Cost				$451.04		$451.04		$264.51		$264.51
Total of All Cost				$1,211.59		$1,381.22		$1,194.70		$1,194.70
Net Projected Returns Per Acre				($461.59)		($256.22)		$368.78		$868.78
Breakeven Price - Total Costs/Ton Grapefruit				$201.93		$153.47		$98.66		$76.73

1M–12-94, Revision

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